CLAIMS

What is claimed is:

1. A method comprising:

receiving one or more sets of downstream multi-carrier tones over a local loop;

transmitting upstream multi-carrier tones;

sampling the downstream carrier tones to generate a first multi-tone signal, the first multi-tone signal having a plurality of component frequencies within a spectrum band of an extended voice-based modem;

sampling the upstream carrier tones to generate a second multi-tone signal, the second multi-tone signal having a plurality of component frequencies within the spectrum band;

dividing a signal power of at least one component frequency of the first multi-tone signal by a signal power of at least one component frequency of the second multi-tone signal to determine a ratio value; and

determining a characteristic of the local loop based upon the ratio value.

2. The method of claim 1 wherein the multi-carrier tones comprise carriers at 172.5 kHz, 241.5 kHz, 276 kHz, 310.5 kHz, 379.5 kHz, and 414 kHz, the plurality of component frequencies comprise frequencies of 0.3 kHz, 1.5 kHz, 2.4 kHz, 3.3 kHz, 4.5 kHz, and 1.2 kHz, the at least one component frequency of the second multi-tone signal comprises a signal at a frequency of 0.4125 kHz, and the characteristic of the local loop is the presence of a loading coil on the local loop.

3. The method of claim 2 wherein determining a characteristic of the local loop based upon the ratio value comprises determining the presence of a loading coil on the local loop if

the ratio is above a specified value, the specified value based upon the plurality of component frequencies of the first multi-tone signal and the at least one component frequency of the second multi-tone signal.

4. The method of claim 2 wherein determining a characteristic of the local loop based upon the ratio value comprises determining the absence of a loading coil on the local loop if the ratio is below a specified value, the specified value based upon the plurality of component frequencies of the first multi-tone signal and the at least one component frequency of the second multi-tone signal.

5. The method of claim 3 wherein the specified value is –10 dB.

6. The method of claim 4 wherein the specified value is -50 dB.

7. The method of claim 1 further comprising:

dividing the plurality of component frequencies of the multi-tone signal into a lower frequency set of component frequencies and a higher frequency set of component frequencies wherein the total power of the lower frequency set of component frequencies is divided by a total power of the higher frequency set of component frequencies to determine a ratio value.

8. The method of claim 7 wherein the multi-carrier tones comprise carriers at 172.5 kHz, 241.5 kHz, 276 kHz, 310.5 kHz, 379.5 kHz, and 414 kHz, the lower frequency set of component frequencies comprises frequencies of 0.3 kHz, 1.5 kHz, and 2.4 kHz, the higher frequency set of frequencies comprises frequencies of 3.3 kHz, 4.5 kHz, and 1.2 kHz, and the characteristic of the local loop is the length of the local loop.

9. A machine-readable medium that provides executable instructions, which when executed by a processing system, cause said processing system to perform a method, the method comprising:

receiving one or more sets of downstream multi-carrier tones over a local loop;

transmitting upstream multi-carrier tones;

sampling the downstream carrier tones to generate a first multi-tone signal, the first multi-tone signal having a plurality of component frequencies within a spectrum band of an extended voice-based modem;

sampling the upstream carrier tones to generate a second multi-tone signal, the second multi-tone signal having a plurality of component frequencies within the spectrum band;

dividing a signal power of at least one component frequency of the first multi-tone signal by a signal power of at least one component frequency of the second multi-tone signal to determine a ratio value; and

determining a characteristic of the local loop based upon the ratio value.

10. The machine-readable medium of claim 9 wherein the multi-carrier tones comprise carriers at 172.5 kHz, 241.5 kHz, 276 kHz, 310.5 kHz, 379.5 kHz, and 414 kHz, the plurality of component frequencies comprise frequencies of 0.3 kHz, 1.5 kHz, 2.4 kHz, 3.3 kHz, 4.5 kHz, and 1.2 kHz, the at least one component frequency of the second multi-tone signal comprises a signal at a frequency of 0.4125 kHz, and the characteristic of the local loop is the presence of a loading coil on the local loop.

11. The machine-readable medium of claim 10 wherein determining a characteristic of the local loop based upon the ratio value comprises determining the presence of a loading coil

on the local loop if the ratio is above a specified value, the specified value based upon the plurality of component frequencies of the first multi-tone signal and the at least one component frequency of the second multi-tone signal.

12. The machine-readable medium of claim 10 wherein determining a characteristic of the local loop based upon the ratio value comprises determining the absence of a loading coil on the local loop if the ratio is below a specified value, the specified value based upon the plurality of component frequencies of the first multi-tone signal and the at least one component frequency of the second multi-tone signal.

13. The machine-readable medium of claim 11 wherein the specified value is –10 dB.

14. The machine-readable medium of claim 12 wherein the specified value is -50 dB.

15. The machine-readable medium of claim 9 wherein the method further comprises:

dividing the plurality of component frequencies of the multi-tone signal into a lower frequency set of component frequencies and a higher frequency set of component frequencies wherein the total power of the lower frequency set of component frequencies is divided by a total power of the higher frequency set of component frequencies to determine a ratio value.

16. The machine-readable medium of claim 15 wherein the multi-carrier tones comprise carriers at 172.5 kHz, 241.5 kHz, 276 kHz, 310.5 kHz, 379.5 kHz, and 414 kHz, the lower frequency set of component frequencies comprises frequencies of 0.3 kHz, 1.5 kHz, and 2.4 kHz, the higher frequency set of component frequencies comprises frequencies of 3.3 kHz, 4.5 kHz, and 1.2 kHz, and the characteristic of the local loop is the length of the local loop.

17. A system comprising:

a processor;

an extended voice-band modem; and

a memory coupled to the processor, the memory having stored thereon one or more executable instructions, which when executed by the processor cause the processor to receive one or more sets of downstream multi-carrier tones over a local loop, transmit upstream multi-carrier tones, sample the downstream carrier tones to generate a first multi-tone signal having a plurality of component frequencies within a spectrum band of the extended voice-based modem, sample the upstream carrier tones to generate a second multi-tone signal having a plurality of component frequencies within the spectrum band, divide a signal power of at least one component frequency of the first multi-tone signal by a signal power of at least one of the component frequencies of the second multi-tone signal to determine a ratio value, and determine a characteristic of the local loop based upon the ratio value.

18. The system of claim 17 wherein the multi-carrier tones comprise carriers at 172.5 kHz, 241.5 kHz, 276 kHz, 310.5 kHz, 379.5 kHz, and 414 kHz, the plurality of component frequencies comprise frequencies of 0.3 kHz, 1.5 kHz, 2.4 kHz, 3.3 kHz, 4.5 kHz, and 1.2 kHz, the at least one component frequency of the second multi-tone signal comprises a signal at a frequency of 0.4125 kHz, and the characteristic of the local loop is the presence of a loading coil on the local loop.

19. The system of claim 18 wherein determining a characteristic of the local loop based upon the ratio value comprises determining the presence of a loading coil on the local loop if

the ratio is above a specified value, the specified value based upon the plurality of component frequencies of the first multi-tone signal and the at least one component frequency of the second multi-tone signal.

20. The system of claim 18 wherein determining a characteristic of the local loop based upon the ratio value comprises determining the absence of a loading coil on the local loop if the ratio is below a specified value, the specified value based upon the plurality of component frequencies of the first multi-tone signal and the at least one component frequency of the second multi-tone signal.

21. The system of claim 19 wherein the specified value is –10 dB.

22. The system of claim 20 wherein the specified value is -50 dB.

23. A system comprising:

a processor;

an extended voice-band modem; and

a memory coupled to the processor, the memory having stored thereon one or more executable instructions, which when executed by the processor cause the processor to receive one or more sets of downstream multi-carrier tones over a local loop, transmit upstream multi-carrier tones, sample the downstream carrier tones into a multi-tone signal having a plurality of component frequencies within a spectrum band of the extended voice-based modem; divide the plurality of component frequencies of the multi-tone signal into a lower frequency set of component frequencies and a higher frequency set of component frequencies, divide a signal power of the lower frequency set of component frequencies by a

signal power of the higher frequency set of component frequencies to determine a ratio value, and determine a characteristic of the local loop based upon the ratio value.

24. The system of claim 23 wherein the multi-carrier tones comprise carriers at 172.5 kHz, 241.5 kHz, 276 kHz, 310.5 kHz, 379.5 kHz, and 414 kHz, the lower frequency set of component frequencies comprises frequencies of 0.3 kHz, 1.5 kHz, and 2.4 kHz, the higher frequency set of component frequencies comprises frequencies of 3.3 kHz, 4.5 kHz, and 1.2 kHz, and the characteristic of the local loop is the length of the local loop.